

Name Maria Rios

Date 5-5-11

## ALGEBRA 1 COMPUTER WORKSHEET NON-LINEAR GRAPHS

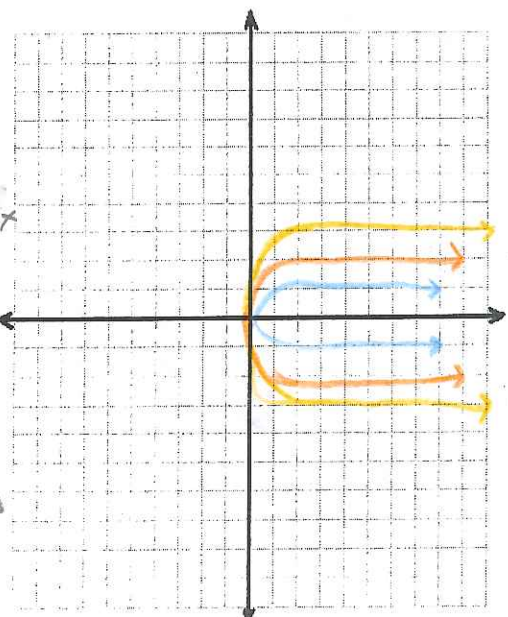
### SLOPE

1. Sketch all 3 graphs on the same axes  
(color coding with key!)

$$Y = x^2$$

$$Y = 2x^2$$

$$Y = 8x^2$$



Generalize: When the  $x^2$  is multiplied by a coefficient of larger than 1, then the graph will become narrower, or get closer to the y-axis.

2. How do you think you might get the graph to be flatter?

Experiment with several options. When you discover the answer, give 3 equations that are flatter and make a generalization.

$$Y = .009x^2$$

$$Y = \frac{1}{8}x^2$$

$$Y = .2x^2$$

Generalize: When the  $x^2$  is multiplied by a coefficient less than 1 but greater than 0, then the graph will become flatter.

3. How do you think you might get the graph to be upside down?

Generalize: When the  $x^2$  is multiplied by a negative, then the graph will go upside down.

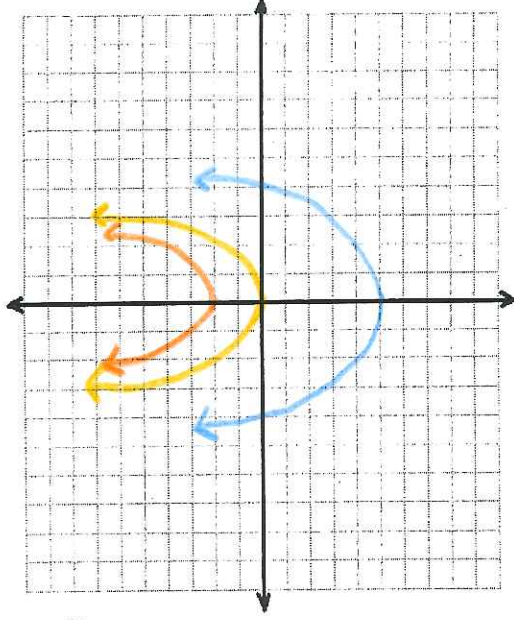
#### TRANSLATION

4. Sketch all 3 graphs on the same axes

$$y = x^2$$

$$y = x^2 + 2$$

$$y = x^2 - 5$$



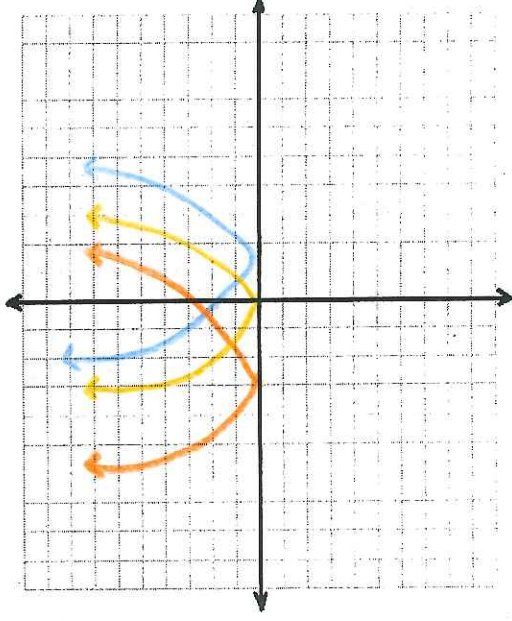
Generalize: When you add to  $x^2$ , the graph will translate up that many units.  
When you subtract from  $x^2$ , the graph will translate down that many units.

5. Sketch all 3 graphs on the same axes

$$y = x^2$$

$$y = (x + 3)^2$$

$$y = (x - 1)^2$$



Generalize: When you add to  $x$  in the parenthesis, the graph will translate left that many units.

When you subtract from  $x$  in the parenthesis, the graph will translate right that many units.

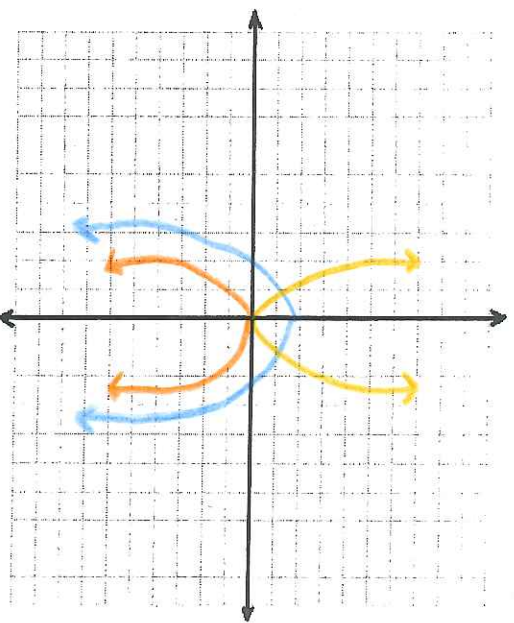
## REFLECTIONS

6. Sketch all 3 graphs on the same axes

$$y = x^2$$

$$y = -x^2$$

$$y = -x^2 + 2$$



Generalize: When  $a$  is positive, the graph will have a minimum.  
When  $a$  is negative the graph will have a maximum.

Using all the generalizations that you made above, can you:

1. Write a quadratic equation for a graph that has a minimum at the point of  $(0, -2)$  and is flatter than  $y = x^2$ ?

$$y = .1x^2 + -2$$

$$y = .1x^2 + -2$$

$$y = .25x^2 + -2$$

2. Write a quadratic equation for a graph that has a maximum at the point of  $(0, 5)$  and is thinner than  $y = x^2$ ?

$$y = -2x^2 + 5$$

3. Write a quadratic equation for a graph that has any vertex at the point of  $(4, -2)$ ?

$$y = (x + 4)^2 + -2$$

4. Write a quadratic equation for a graph that has a maximum at  $(-2, 0)$ ?

